CLAIMS

1. An acicular silicon crystal having a substantial conical shape tapered to have a radius of curvature of not less than 1 nm to no more than 20 nm at its tip end and having a diameter of bottom surface of not less than 10 nm, and a height equivalent to or more than the diameter of bottom surface.

2. The acicular silicon crystal according to claim 1, wherein the diameter of bottom surface is not less than 10 nm to no more than 50000 nm, and the height is not less than 10 nm to no more than 200000 nm.

3. The acicular silicon crystal according to claim 1 or 2, wherein it is oriented perpendicularly to a surface of the substrate.

4. The acicular silicon crystal according to claim 1 or 2, wherein a surface thereof is coated with a thin carbon film.

5. A method for producing an acicular silicon crystal, wherein an indefinite large number of microscopic acicular crystals are uniformly formed on a surface of a silicon surface by plasma CVD method using a catalyst, in such a manner that they are oriented perpendicularly to the substrate.

6. The method for producing an acicular silicon crystal according to claim 5, wherein in the plasma CVD method, after uniformly adhering catalytic metal micro particles on the surface of the silicon substrate, discharge plasma is caused to generate by microwave power while supplying a hydrocarbon-based gas and a carrier gas, thereby forming on the surface of the silicon

substrate acicular crystals whose surfaces are coated with a thin carbon film.

7. The method for producing an acicular silicon crystal according to claim 5 or 6, wherein an n-type low resistive silicon substrate is used as the silicon substrate.